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Do financial incentives stimulate partially disabled persons to return to work?

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DESIGN PAPER 155

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Summary

In 2006, the Dutch government introduced the Work and Income (Capacity for Work) Act as the culmination of the disability insurance reforms implemented in the past two decades. It consists of a scheme for fully disabled individuals (IVA), aimed at income protection, and a scheme for partially disabled individuals (WGA), aimed at work resumption. The activating effect of the WGA is important for policymakers because the annual inflow into the WGA more than doubled between 2006 and 2018. We evaluate the impact of the financial incentives of the WGA program among partially disabled individuals who received disability benefits between 2006 and 2013. We show that the program increases the average labor participation of this group by 4.7 percentage points and daily earnings by 4.83 euros. We identify low income earners, older individuals, and those working in the public sector as vulnerable groups, who struggle to respond to the program and to increase their labor participation. The reform of the Dutch disability insurance system is characterized by financial incentives for employers and employees, stricter screening, and tighter eligibility criteria. The findings suggest that financial incentives for employees significantly add to the effectiveness of the disability scheme, and that they contribute to an increasing recognition that disabled individuals can utilize their remaining work capacities to considerable extents. However, financial incentives are much less effective for the comparatively large group of low-income earners. Benefits are already near the social minimum wage for a large part of this group, and possibilities for increasing the financial incentives for work seem limited. The opportunities to increase their labor participation are limited not only by their disability but also their lack of skills.

Samenvatting

In 2006 is, als sluitstuk van een ingrijpende hervorming van het Nederlandse arbeidsongeschiktheidsstelsel, de Wet werk en inkomen naar arbeidsvermogen (WIA) geïntroduceerd, bestaande uit een regeling voor volledig arbeidsongeschikten (IVA), gericht op inkomensbescherming, en een regeling voor gedeeltelijk arbeidsongeschikten (WGA), gericht op activering. De activerende werking van de WGA is belangrijk voor beleidsmakers, zeker gezien het feit dat de jaarlijkse instroom in de WGA tussen 2006 en 2018 meer dan verdubbelde. In deze studie onderzoeken we de effectiviteit van de financiële prikkels op gedeeltelijk arbeidsongeschikten in de WGA tussen 2006 en 2013. Als gevolg van die financiële prikkels neemt de gemiddelde arbeidsparticipatie onder gedeeltelijk arbeidsongeschikten toe met 4,7 procentpunten en stijgen hun verdiensten op dagbasis met 4,83 euro. De effectiviteit van de prikkels en de toename van de arbeidsparticipatie blijven echter achter bij gedeeltelijk arbeidsongeschikten die ouder zijn, een laag inkomen hebben of in de publieke sector werkzaam waren. De hervorming van het Nederlandse stelsel van arbeidsongeschiktheidsregelingen wordt gekenmerkt door financiële prikkels voor werkgevers en werknemers, een betere poortwachter en strengere toelatingscriteria. De financiële prikkels in de WGA blijken toegevoegde waarde te hebben bovenop deze combinatie van beleidsmaatregelen en laten zien dat er ruimte is om de resterende verdiencapaciteit van gedeeltelijk arbeidsongeschikten beter te benutten. Voor lagere inkomens zijn de financiële prikkels echter veel minder effectief omdat hun uitkering al dichtbij het sociaal minimum ligt, en omdat hun mogelijkheden tot arbeidsdeelname niet alleen beperkt worden door hun arbeidsongeschiktheid maar ook door gebrek aan vaardigheden.

1. Introduction

By the early years of this century the relative share of disabled workers in the working population in the Netherlands had risen to one of the highest in the world. The yearly inflow into the Dutch disability scheme reached about 1.5% of the working population. From 1998 onwards the Dutch government implemented a series of reforms to limit the access to the disability insurance scheme. In 2006, the Work and Income According to Labor Capacity Act (WIA) came into effect as the culmination of these reforms, replacing the Disability Insurance Act (WAO). The WIA resulted in a yearly inflow of around 0.5% of the working population from 2006 and onwards, thus one third of the inflow in the WAO (Van Sonsbeek and Gradus, 2013).

Compared to the WAO, the WIA extended the sickness benefit scheme that precedes the disability benefit scheme from one to two years, and it introduced stricter criteria to enter the disability scheme. Furthermore, it introduced a work resumption program for partially disabled workers at the more advanced stage of the disability scheme. The program provides strong financial incentives to increase hours worked or labor participation.

While the effects of the stricter entitlement rules of the new disability scheme have clearly been shown to be substantial, the effect of the work resumption program has been studied far less and remains unclear. In the new disability scheme, sick employees first stay for two years with their employer before they can claim a disability benefit. Thereafter, they qualify for a disability benefit of 70% of their former wage for a period of 3 to a maximum of 38 months. After this period, however, if a partially disabled worker does not work a threshold number of hours, the benefit drops to a substantially lower level. Furthermore, the unemployment benefit, which is incorporated in the disability benefit, expires and no longer constitutes part of the disability benefit. Although these financial incentives are strong, they are offered only after a period of sickness of up to 5 years and 2 months, thereby complicating a successful return to the labor market. Indeed, work resumption from disability is easiest when this happens with the former employer and as soon as possible after falling ill (Koning and Lindeboom, 2015).

Koning and van Sonsbeek (2017) studied the impact of the work resumption program on labor participation, daily earnings, and full work resumption among partially disabled individuals. They exploited the variation in the duration of benefit entitlement to identify the impact of the work incentives of the program and the variation in the size of the work incentives, in order to test whether the effects of the work incentives are proportional to their size. In our study we take a different econometric

approach to identify the impact of the work resumption program. Applying a difference-in-differences regression analysis, we exploit the variation in pre-sickness earnings across beneficiaries, which directly underlies the financial incentive of the work resumption program. As the program offers higher financial incentives to individuals with higher pre-sickness earnings, our empirical approach allows us to identify the labor market responses to higher financial incentives in greater detail.

We show that the work resumption program increases labor participation by 4.7 percentage points and daily earnings by 4.83 euros, for the average beneficiary. We identify low income earners, older individuals, and those working in the public sector as vulnerable groups, who struggle to respond to the program and increase their labor participation.

The remainder of this paper is organized as follows. Section 2 describes the work resumption program of the disability scheme. Section 3 describes the data. Section 4 presents descriptive statistics. Section 5 presents evidence on the impact of the work resumption program in the overall population of partially disabled workers and in sub-groups of this population. Section 6 discusses policy implications.

2. The work resumption program for disabled workers

A new disability benefit scheme (the Work and Income according to Labour Capacity Act) was introduced in the Netherlands in 2006. Individuals who lose part of their earning capacity due to a health impairment are entitled to a sickness benefit from their employer for a period of two years. When the sickness benefit expires, they enter a two-stage disability scheme. In the first stage they are eligible for the wage-related benefit. The benefit amount is given by

$$\textit{Wage-related} = 0.7 \times \text{Pre-sickness wage} \times (1-(1-\text{Disability degree}) \times \text{Utilization rate}). \quad (1)$$

The pre-sickness wage is the daily wage earned before the individual became sick. Utilization rate is the fraction of the remaining earning capacity the individual works during the wage-related period. Individuals who lose 35 to 80% of their earning capacity are eligible for the benefit. The benefit is paid for a minimum of 3 and a maximum of 38 months, depending on the employment history of the individual. Each year of employment contributes one month to the duration of the benefit. The benefit consists of a disability component and an unemployment component. The amount of the disability component depends on the degree of disability.

When the wage-related benefit expires, the individual enters the second stage of the disability scheme and is then eligible for one of two types of benefits, depending on how much the individual utilizes his or her remaining earning capacity. If the individual utilizes more than 50% of his or her remaining work capacity, he or she is eligible for the wage-supplement benefit. The benefit amount is given by

$$\textit{Wage-supplement} = 0.7 \times \textit{Pre-sickness wage} \times \text{Disability degree}. \quad (2)$$

If the individual utilizes less than 50% of his or her remaining work capacity, he or she is eligible for the follow-up benefit. The benefit amount is given by

$$\textit{Follow-up} = 0.7 \times \overline{\textit{Pre-sickness wage}} \times \text{Disability degree}, \quad (3)$$

where $\overline{\textit{Pre-sickness wage}}$ is the daily wage before the individual became sick, but it is capped by the amount of the minimum wage.

When the first stage of the disability scheme ends, the individual is confronted with two types of financial incentives to increase the work effort. The first financial incentive is to utilize at least 50% of the remaining work capacity. If the individual

does this, he or she is then eligible for the wage-supplement benefit. Otherwise the individual is eligible for the lower follow-up benefit. The difference between the follow-up and wage-supplement benefits is

$$\textit{Follow-up-Wage-supplement} = -0.7 \times (\text{Pre-sickness wage} - \overline{\textit{Pre-sickness wage}}) \times \text{Disability degree}, \quad (4)$$

and it represents the financial penalty the individual faces if he or she ends up in the follow-up benefit instead of the wage-supplement benefit when the first stage of the disability scheme ends. The penalty is higher the more the pre-sickness wage exceeds the minimum wage, or the higher the disability degree. The incentive does not depend on the number of hours worked. This means that the program offers only a small incentive to increase work effort beyond the 50% threshold utilization rate once the individual meets this threshold rate.

The individual faces a second financial incentive to increase work effort at the end of the first stage of the disability scheme, regardless of which of the two types of benefits the person qualifies for in the second stage of the scheme. The incentive is due to the reduction in the amount of the benefit in the second stage of the disability scheme compared to the amount of the benefit in the first stage of the scheme. This reduction results from the fact that the unemployment benefit is a component of the wage-related benefit in the first stage of the disability scheme, while it expires and is not a component of either the wage supplement or the follow-up benefit in the second stage of the disability scheme.

If the individual utilizes at least 50% of the remaining work capacity and qualifies for the wage-supplement benefit in the second stage of the disability scheme, the financial penalty that the individual faces during the wage-supplement period is given by the difference between the wage supplement and wage-related benefits as

$$\textit{Wage-supplement-Wage-related} = -0.7 \times \text{Pre-sickness wage} \times (1 - \text{Disability degree}) \times (1 - \text{Utilization rate}). \quad (5)$$

The penalty is greater if the pre-sickness wage is higher at a given disability degree and work effort during the wage-related period. The penalty is zero if the individual utilizes his or her remaining earning capacity to its maximum potential.

If the individual utilizes less than 50% of the remaining work capacity and qualifies for the follow-up benefit in the second stage of the disability scheme, the

financial penalty that he or she faces during the follow-up period is given by the difference between the follow-up and wage-related benefits as

$$\textit{Follow-up-Wage-related} = -0.7 \times (\text{Pre-sickness wage} \times (1-(1-\text{Disability degree}) \times \text{Utilization rate}) - \overline{\textit{Pre-sickness wage}} \times \text{Disability degree}). \quad (6)$$

The penalty is greater if the pre-sickness wage is higher at a given disability degree and work effort during the wage-related period.

If the amount of the social security benefit (sickness, disability, unemployment benefits) or the wage earned during the second year of sickness (in the WIA) is lower than the applicable social minimum, it is supplemented up to the social minimum according to the Supplementary Benefits Act (Toeslagenwet). The sum of the social security benefit and the social minimum supplement cannot exceed the former wage. If the individual lives with a partner, the supplement is granted if the combined income of the individual and the partner is below the social minimum. If the individual lives alone, the amount of the supplement depends on whether the individual has children. The social minimum supplement reduces the financial incentive of the work resumption program for individuals who receive small benefits in the second stage of the disability scheme.

Figure 1 demonstrates the financial incentives of the work resumption program. The figure presents daily amounts for wage income, disability benefit, and social minimum supplement during the first and second stages of the disability scheme, based on assumed amounts for pre-sickness wage, disability degree, and remaining work capacity utilization rates during the first and second stages of the disability scheme. The figure also shows the total income from the three sources of income. In the figure we distinguish between individuals who earn different wages before they fall sick. In particular, we distinguish between individuals who earn different percentages of the minimum wage before they fall sick: at most 100%, 150 to 200%, and at least 250% of the minimum wage. Furthermore, we distinguish between individuals who utilize their remaining earning capacities at different rates in the second stage of the disability scheme. We assume, however, that all individuals utilize their remaining earning capacities at the same rate of 50% during the first stage of the disability scheme. Furthermore, we assume that all individuals have a disability degree of 40%.

Notable differences across the individuals with different pre-sickness wages and rates of remaining earning capacity utilization are the following. First, individuals with the lowest pre-sickness wage (top panel in the figure) face no financial penalty

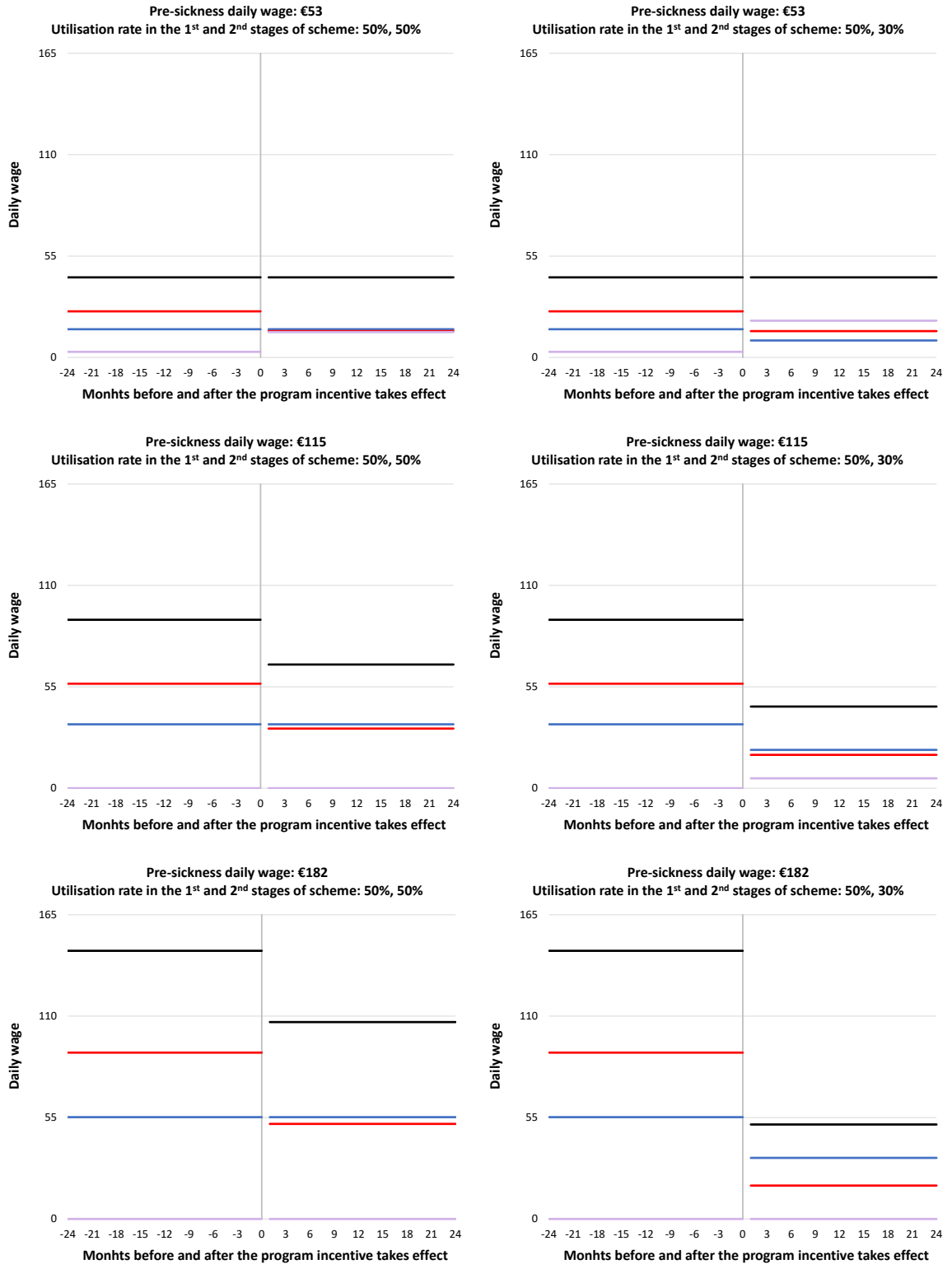

Figure 1: Wage income (blue), disability benefit (red), social minimum supplement (pink), and total income (black) on a daily basis in euro amounts by three pre-sickness wage groups, when individuals who are 40% disabled utilize 50% of their remaining earning capacity during the wage-related period, and when they utilize 50% (left panel) and 30% (right) of their remaining earning capacity during the follow-up period.

because their benefit level decreases by a small amount from the first to the second stage of the disability scheme, which is compensated by a higher social minimum supplement. Individuals with higher pre-sickness wages face higher penalties, regardless of which of the two types of disability benefits they opt for in the second stage of the disability scheme. These income patterns show that individuals with higher pre-sickness wages are more incentivized to increase their work effort as they approach the second stage of the disability scheme or during that stage.

Second, individuals face a financial penalty in the second stage of the disability scheme regardless of which of the two types of disability benefits they opt for in that stage. This penalty arises because the unemployment benefit component of the disability benefit expires at the end of the first stage of the scheme.

Third, individuals who utilize less than 50% of their remaining earning capacity, and hence qualify for the follow-up benefit, face a higher penalty in the second stage of the disability scheme than individuals who utilize more than 50% of their remaining earning capacity and qualify for the wage-supplement benefit in the second stage of the disability scheme. The higher penalty for the former group of individuals reflects the fact that the follow-up benefit is lower than the wage-supplement benefit.

3. Data

To study the impact of the work resumption program, we use administrative data supplied by the Employee Insurance Agency (UWV). The data contains monthly observations for all employees insured under the disability scheme and entered the disability scheme between January 2006 and December 2013. The data contain information on personal, work, and disability characteristics such as the pre-sickness wage, post-disability wage, degree of disability, and type of health impairment.

Individuals who participate in the disability scheme can leave and re-enter the disability scheme multiple times. Moreover, an individual who participates in the second stage of the disability scheme can be forced to participate in the first stage of the scheme following a reassessment of the person's disability status. Individuals can also switch between the two types of second-stage benefits. In our analysis we do not consider individuals who make multiple entries to the disability scheme or who switch between different types of benefits during their participation in the scheme. For these individuals it is difficult, if not impossible, to analyze the impact of the work resumption program as their work and income trajectories are too complicated. This means that our sample data include only individuals who start claiming the wage-related benefit in the first stage of the scheme, and then the wage supplement or the follow-up benefit in the second stage. In total, 538,146 observations for 9,766 individuals are used to conduct the analysis.

Table 1: Sample means of background characteristics and outcomes in control and treatment before and after the expiry date of Wage-related benefit

	Before			After		
	Pre-sickness wage smaller than or equal to 100 percent of minimum wage (1)	Pre-sickness wage larger than 100 percent of minimum wage (2)	Difference (3)	Pre-sickness wage smaller than or equal to 100 percent of minimum wage (4)	Pre-sickness wage larger than 100 percent of minimum wage (5)	Difference (6)
A. Individual characteristics						
Age	45.92	49.22	3.30	48.12	51.52	4.44
Male (%)	0.17	0.57	0.40	0.17	0.57	0.40
Married (%)	0.54	0.55	0.01	0.54	0.55	0.01
Disability grade > 50% (%)	0.26	0.41	0.15	0.26	0.43	0.17
Months with Wage-related benefit	23.91	28.12	4.21			
Months with Wage-supplement benefit				37.87	37.53	−0,34
Months with Follow-up benefit				42.01	40.09	1,37
Pre-sickness daily wage	53.00	127.40	74.40	55.05	132.27	77.22
With social minimum supplement (%)	0.19	0.02	−0.17	0.33	0.19	−0.14
B. Labor outcomes						
Labor participation (%)	0.38	0.52	0.14	0.39	0.56	0.17
Daily wage while disabled	10.77	34.46	23.69	11.95	39.27	27.32
Observations	29,775	508,371				
Individuals	563	9,202				

Notes:

1. "Before" denotes the Wage-related period. "After" denotes the Wage-supplement or the Follow-up benefit that succeed the Wage-related period. Individuals with pre-sickness wages smaller and larger than the minimum wage constitutes the control and treatment groups, respectively.
2. Columns 1, 2, 4, and 5 present means of characteristics and outcomes of individuals in control and treatment before and after the expiry date of the Wage-related benefit. Columns 3 and 6 present the differences between treatment and control.
3. A sample mean is calculated first by obtaining the average of the observations of a given characteristic for each individual in the sample, and then by calculating the mean of all averages in a given group (control and treatment) during a given period (before and after the expiry date of Wage-related benefit).
4. Wages are adjusted for the average wage increase and inflation.

4. Descriptive statistics

Table 1 presents descriptive statistics on individual characteristics and labor market outcomes by pre-sickness wage group before (columns 1 and 2) and after (columns 4 and 5) the expiry date of the wage-related benefit. The table also presents the difference between the means of two wage groups before (columns 3) and after (columns 6) the expiry date of the wage-related benefit.

Panel A of Table 1 shows sample means for background, disability, and work characteristics. For both pre-sickness wage groups, the average age is approximately 50 years. The share of males is much higher in the group with higher pre-sickness earnings. This is to be expected since women typically occupy part-time jobs and earn lower wages. About 55% of the individuals are married.

Of the individuals in the low pre-sickness wage group, 26% have a disability degree above 50% during the wage-related period. Among the individuals in the high pre-sickness wage group, the corresponding fraction is 41%.[1] The fraction of individuals with a disability degree above 50% slightly increases after the wage-related period for the high pre-sickness wage group. This can be due to health deterioration over time. On average, individuals claim the wage-related benefit for about two years and the wage-supplement or the follow-up benefit for three years. The duration of the wage-related benefit is about four months longer for individuals with higher pre-sickness earnings. A possible explanation is that the duration of the wage-related benefit is a function of the years worked before disability. Workers with higher pre-sickness earnings may have worked more years possibly because they are more attached to their work.

On average, the daily wage before sickness is about 50 euros for the low pre-sickness wage group and 130 euros for the high pre-sickness wage group. This increases slightly over the course of the disability period due to wage indexation. A higher fraction of the individuals in the low pre-sickness wage group receive the social minimum supplement since their (total) income more often falls below the income threshold for eligibility for the social minimum supplement. For both pre-sickness wage groups, higher fractions of individuals receive the social minimum supplement

1 The higher disability degree for the high pre-sickness wage group is due to the definition of the disability degree. Disability degree is determined by dividing the estimated wage loss due to disability by the pre-sickness wage, where estimated wage loss is the difference between the pre-sickness wage and the potential wage that the sick individual can still earn. A higher pre-sickness wage does not necessarily result in a higher potential wage, thus leading to a higher disability degree among those with a higher pre-sickness wage.

during the wage-supplement or follow-up benefit period. A potential reason is that the follow-up benefit is much lower than the wage-related benefit, so that individuals more often become eligible for the social minimum supplement.

Panel B of Table 1 presents the sample means of outcome variables. The high pre-sickness wage group earns more and participates in the labor market more often than the low pre-sickness wage group. Both groups slightly increase their labor participation and daily earnings when their wage-related benefits expire.
For all background and disability characteristics, the mean differences between the two pre-sickness wage groups are small, suggesting that the two groups are similar and comparable. The mean differences in outcome variables are larger during the wage-supplement or follow-up period compared to those during the wage-related period. This provides informal evidence that the work resumption program is effective.

Figure 2 plots the probability of working and average daily wage against the time around the expiry date of the wage-related benefit, when individuals face the financial incentives of the work resumption program. A time window of four years around the expiry date of the wage-related benefit is considered. We also draw a 95% confidence interval around the average daily wage. In the figure we distinguish between individuals with pre-sickness wages below and above the minimum wage.

For partially disabled workers with pre-sickness wages below the minimum wage, we do not observe any change in labor participation or earnings at the expiry date of the wage-related benefit. This is as expected since the work resumption program offers only a small incentive, or none at all, to increase work effort for individuals with pre-sickness wages equal to or less than the minimum wage (Section 2). For partially disabled workers with pre-sickness wages above the minimum wage, we observe jumps at the expiry date of the wage-related benefit for both labor participation and daily wage. The confidence intervals do not cross, suggesting that the jumps are statistically significant. The jumps suggest that labor participation and daily wage change significantly at the expiry date of the wage-related benefit, providing descriptive evidence that the work resumption program is effective.

Another observation worth noting is that partially disabled individuals with pre-sickness wages below the minimum wage decrease their labor participation and daily earnings substantially throughout the wage-related benefit period. This shows that the labor market behavior of this group differs substantially from the group of individuals with higher pre-sickness wages. This means that in an analysis of the labor market behavior of partially disabled individuals, it is important to distinguish partially disabled individuals with respect to their pre-sickness earnings levels.

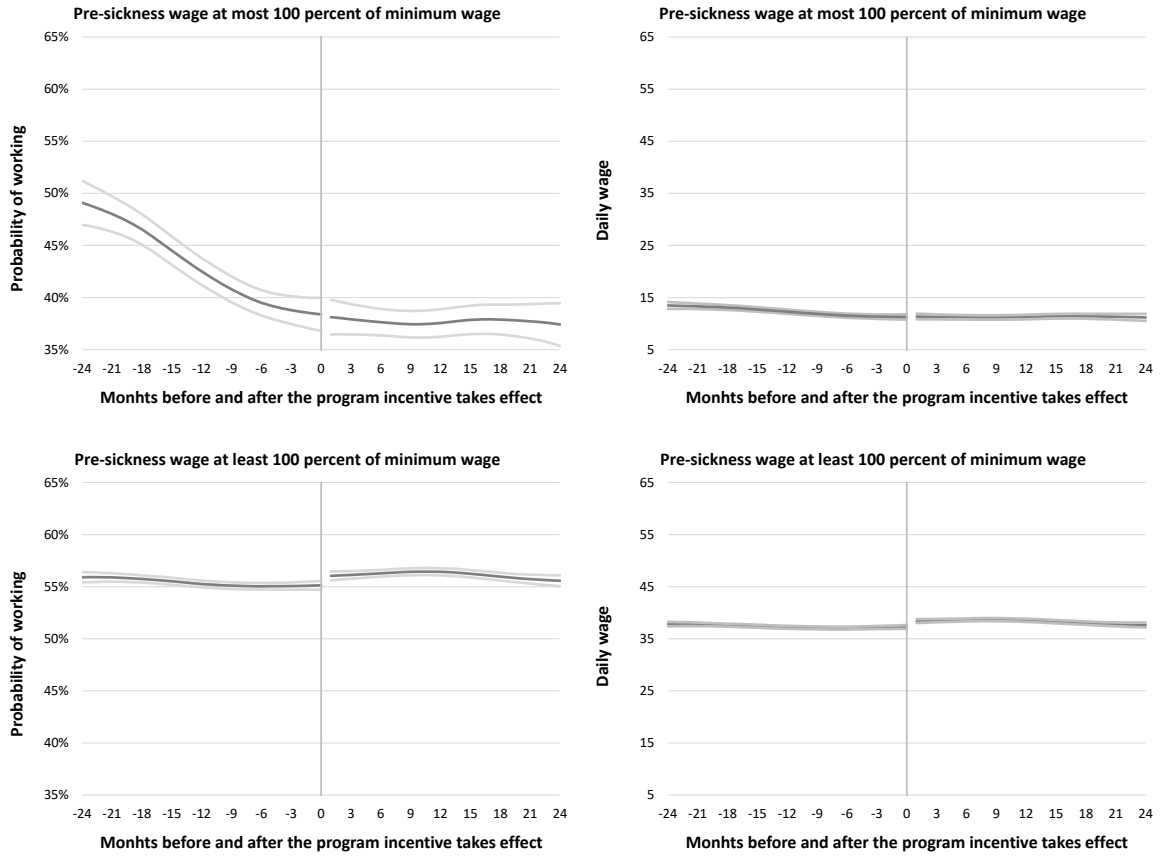

Figure 2: Probability of working and average daily wage against the time around the expiry date of the wage-related benefit by pre-sickness wage groups. 95% confidence interval around the outcome. Time is measured in months.

As discussed in Section 2, the higher the pre-sickness earnings, the stronger the financial incentive of the work resumption program. In Figure 3 we plot the probability of labor participation and average daily wage against the time around the date of the program incentive for four different pre-sickness wage groups. In each group the pre-sickness wage is a certain fraction of the minimum wage. The fractions considered are 100-150%, 150-200%, 200-250%, and above 250%. As in Figure 2, the plots allow for a jump at the date of the program incentive. The figure shows that individuals with higher pre-sickness earnings increase their daily earnings more at the time of or after the program incentive. However, the increases at the time of the program incentive are less pronounced for labor participation.

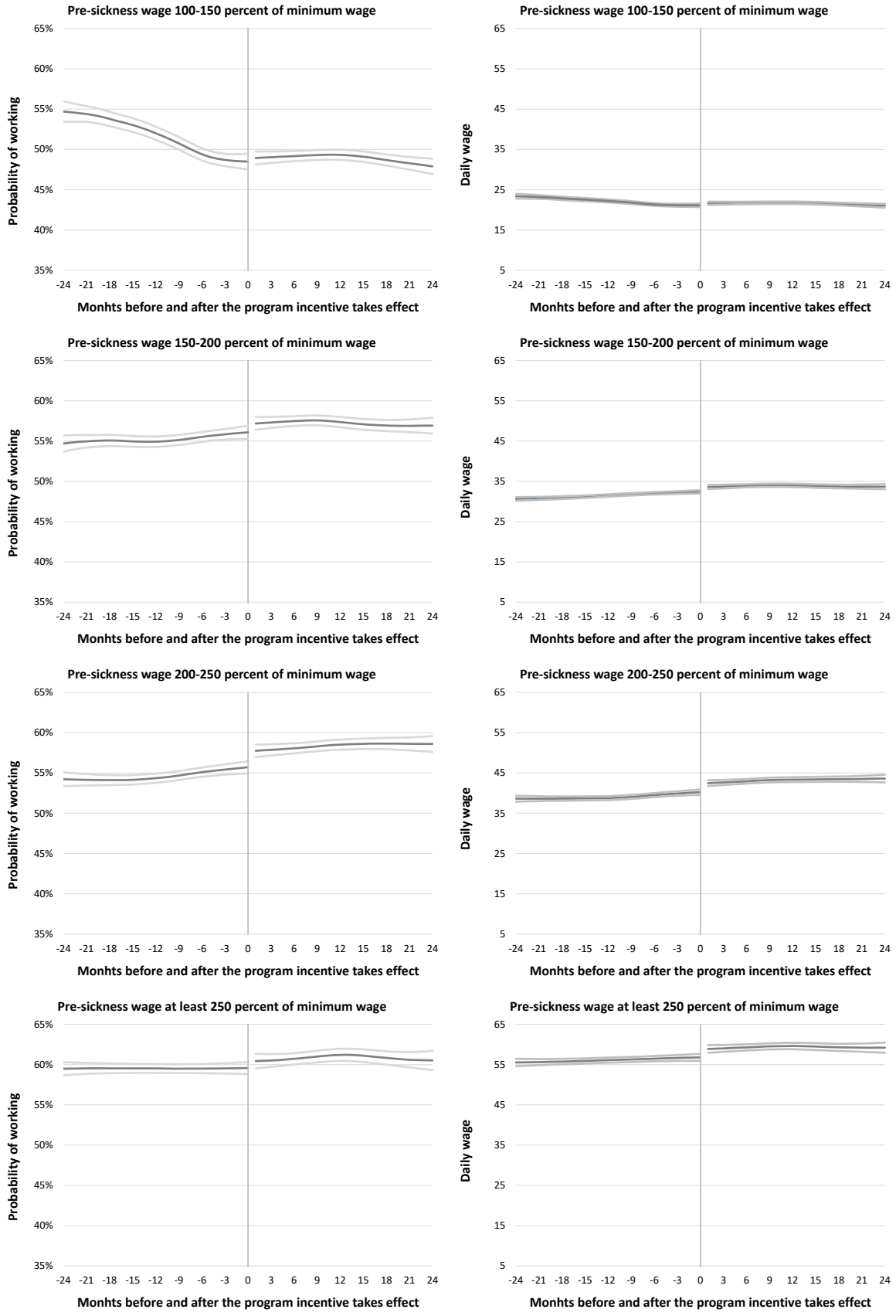

Figure 3: Probability of working and average daily wage against the time around the expiry date of the wage-related benefit by pre-sickness wage groups. 95% confidence interval around the outcome. Time is measured in months.

5. The impact of the work resumption program

Impact of the program

The descriptive analysis above suggests that partially disabled individuals with higher pre-sickness earnings on average increase their labor participation and earnings more than those with lower pre-sickness earnings when they face the financial incentive of the work resumption program in the second stage of the disability scheme. The changes in the averages of the outcome variables from the first to the second stage of the disability scheme can be compared across the two groups with different pre-sickness earnings, and can be interpreted as the impact of the work resumption program on the labor supply of partially disabled individuals. This can be done using regression analysis based on the difference-in-differences method.

The difference-in-differences method is a technique that is widely used in analyses of the effects of social security programs and labor market policy reforms. In our application of the model in particular, the difference between two differences is calculated and used as an estimator of the impact of the work resumption program. First, the mean of the outcome variable during the first stage of the disability scheme (wage-related period) is subtracted from that during the second stage of the disability scheme (wage-supplement or follow-up period). This difference is calculated for two groups of individuals. The first group consists of individuals with pre-sickness earnings above the minimum wage, while the second group consists of individuals with pre-sickness earnings below the minimum wage. Second, the difference between the two mean differences for the two pre-sickness wage groups is calculated. The calculated difference-in-differences represents the impact of the work resumption program.

The difference-in-differences method is implemented using linear regression, where the outcome variable is explained by an interaction variable that is the product of an indicator of whether pre-sickness wage of the individual equals the minimum or a higher wage, and an indicator of the period corresponding to the second stage of the disability scheme. The effect of the interaction variable on the outcome variable is interpreted as the impact of the work resumption program.

In the regression model, we control for potential factors that could affect daily earnings. In particular, we control for quadratic age, marital status, disability degree, whether the individual receives the social minimum supplement, and calendar month indicators for the observation period from January 2006 to December 2013. We also allow for intercepts that vary across individuals to control for individual heterogeneity. Our regression results do not change by any considerable amount if we

Table 2: Impact of the work resumption program on labor participation and daily wage earned while disabled

	Labor participation	Daily wage
Overall impact of the program	0.047*** (0.010)	4.828*** (0.387
Observations	538,074	
Individuals	9,766	
R-squared (within)	0.025	0.059

Notes: All regressions employ the linear regression model with fixed effects and include calendar month dummies for the periods of time before and after the expiry date of the wage-related benefit, quadratic age, marital status, disability degree, and whether the individual receives the social minimum supplement. Standard errors, in parentheses, are adjusted for clustering at the individual level. ***, **, * indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively.

consider different functional forms of age, or if we omit any of the factors considered in the regression.

Table 2 presents the impact of the work resumption program on two outcome variables. The first is a dummy variable indicating labor participation. The impact of the work resumption program is interpreted as the impact on the probability of working. The second is daily earnings during disability. We consider the daily earnings of all disability benefit recipients and do not condition on their labor participation status. The impact of the work resumption program is interpreted as the impact on the average of daily earnings of all disability benefit recipients. The table shows that the work resumption program increases the probability of working of the average beneficiary by 4.7 percentage points, and that it increases the daily earnings of the average beneficiary by 4.83 euros.[2] Both effects are statistically highly significant. They also seem economically large. For example, the impact size of 4.83 euros corresponds to 13.44% of the average daily earnings in the sample data.

The impact of the work resumption program on labor participation we find is substantially larger than that found by Koning and van Sonsbeek. They showed that the program increases the probability of working by 2.5 percentage points and daily earnings by 2.67 euros. With the new results from our study it can be confirmed that the financial incentives in the work resumption program have substantial positive effects on both work incidence and earnings.

2 The estimated effects of the program are interpreted as causal effects if the parallel trends assumption that underlies the difference-in-differences method is satisfied. A discussion of this assumption is provided in the Appendix.

Table 3: Impact of the work resumption program on labor participation and daily wage earned while disabled, by pre-sickness wage group

	Labor participation	Daily wage
Pre-sickness wage is 100–150% of min. wage	0.030***	2.120***
	(0.011)	(0.411)
Pre-sickness wage is 150–200% of min. wage	0.049***	4.316***
	(0.011)	(0.450)
Pre-sickness wage is 200–250% of min. wage	0.061***	6.390***
	(0.011)	(0.566)
Pre-sickness wage is ≥ 250% of min. wage	0.046***	6.749***
	(0.011)	(0.679)

Notes: All regressions employ the linear regression model with fixed effects and include calendar month dummies for the periods of time before and after the expiry date of the wage-related benefit, quadratic age, marital status, disability degree, and whether the individual receives the social minimum supplement. Standard errors, in parentheses, are adjusted for clustering at the individual level. ***, **, * indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively.

As discussed in Section 2, the financial incentive of the work resumption program is larger for partially disabled individuals with higher pre-sickness earnings. In Table 3 we distinguish between four groups of partially disabled workers with different pre-sickness earnings, and investigate whether and how the impact of the work resumption program depends on the level of pre-sickness earnings. In particular, we consider individuals who earned 150 to 200 percent, 150 to 200 percent, 200 to 250 percent, and at least 250 percent of the minimum wage before they fell sick.

The table shows that both the magnitude and the statistical significance of the impact of the work resumption program on daily earnings is larger when pre-sickness earnings are higher. This is also true for labor participation, except that the impact of the work resumption program is largest among the group of individuals whose pre-sickness wages are 200 to 250 percent of the applicable minimum wage, instead of the group of individuals with the highest pre-sickness earnings. These are the expected larger effects of the work resumption program across individuals with higher pre-sickness earnings.

Vulnerable groups

Individuals with different socio-economic characteristics may respond to the financial incentives of the work resumption program to different extents. Here we identify the sub-groups of individuals in the population of partially disabled individuals who are less responsive to the work resumption program, and who are therefore less able to increase work effort due to their work-limiting health problem. In Tables 4 through

Table 4: Impact of the work resumption program on labor participation and daily wage earned while disabled, by age group

Age group	Labor participation	Daily wage
≥ 30 and < 40	0.048*** (0.010)	6.008*** (0.690)
≥ 40 and < 50	0.081*** (0.020)	6.615*** (0.861)
≥ 50 and < 60	0.011 (0.023)	3.166*** (0.689)
≥ 60	0.011 (0.024)	0.605 (0.788)

Notes: All regressions employ the linear regression model with fixed effects and include calendar month dummies for the periods of time before and after the expiry date of the wage-related benefit, quadratic age, marital status, disability degree, and whether the individual receives the social minimum supplement. Standard errors, in parentheses, are adjusted for clustering at the individual level. ***, **, * indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively.

7, we distinguish among partially disabled workers based on their age, disease type, employment status, and sector of employment. Age, employment status, and sector of employment are those at the time individuals fall sick. Disease type is that at the time the individual is assessed for disability.

Table 4 shows the impact of the work resumption program across four age groups. The impact of the program is large for individuals younger than 50 years, for both labor participation and daily earnings. The impact of the program is substantially smaller for individuals between 50 and 60 years, and small and statistically insignificant for individuals who are 60 years or older. These results show that older individuals struggle to respond to the financial incentives of the work resumption program. A potential explanation is that older individuals find working more onerous. Another reason may be that older individuals face employer restrictions that limit reintegration into the labor market.

Table 5 shows results across five disease types. The table shows the largest effects for neoplasms for both labor participation and daily earnings. In general, health conditions of individuals diagnosed with neoplasms improve substantially over time. It can also be that employers are particularly willing to facilitate their work resumption compared to individuals with other disease types. A second finding is that for any disease type, individuals respond to the program by increasing their number of work hours, but struggle to resume working after a period of unemployment. This is in line with the results from Kantarcı et al. (2019), who show small labor supply responses at the extensive margin but large responses at the intensive margin when

Table 5: Impact of the work resumption program on labor participation and daily wage earned while disabled, by impairment type

Impairment type	Labor participation	Daily wage
Neoplasms	0.138*	8.168***
	(0.056)	(2.179)
Mental and behavioral disorders	0.038**	4.185***
	(0.014)	(0.594)
Diseases of the circulatory system	0.021	3.399**
	(0.037)	(1.195)
Diseases of the musculoskeletal system and connective tissue	0.053*	4.510***
	(0.023)	(1.162)
Other	0.043*	5.201***
	(0.017)	(0.613)

Notes: All regressions employ the linear regression model with fixed effects and include calendar month dummies for the periods of time before and after the expiry date of the wage-related benefit, quadratic age, marital status, disability degree, and whether the individual receives the social minimum supplement. Standard errors, in parentheses, are adjusted for clustering at the individual level. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

sick individuals are subjected to the stricter disability benefit regime of the WIA compared to that of the WAO. It appears that the prospects of finding a job substantially decrease after a period of unemployment due to disability.

The results for both age and disease type are in line with the findings of Koning and van Sonsbeek. New insights follow from the results for employment status and sector. Table 6 presents results by employment status. While all partially disabled

Table 6: Impact of the work resumption program on labor participation and daily wage earned while disabled, by employment status

Employment status	Labor participation	Daily wage
Permanent	0.055***	4.549***
	(0.014)	(0.549)
Temporary	0.054*	6.373***
	(0.021)	(0.898)
Unemployed	0.056**	4.125***
	(0.022)	(0.713)

Notes: All regressions employ the linear regression model with fixed effects and include calendar month dummies for the periods of time before and after the expiry date of the wage-related benefit, quadratic age, marital status, disability degree, and whether the individual receives the social minimum supplement. Standard errors, in parentheses, are adjusted for clustering at the individual level. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 7: Impact of the work resumption program on labor participation and daily wage earned while disabled, by employment sector

Sector	Labor participation	Daily wage
Government	0.020	3.304***
	(0.023)	(0.919)
Health care	0.044	4.079***
	(0.026)	(0.882)
Private	0.052***	5.371***
	(0.012)	(0.484)

Notes: All regressions employ the linear regression model with fixed effects and include calendar month dummies for the periods of time before and after the expiry date of the wage-related benefit, quadratic age, marital status, disability degree, and whether the individual receives the social minimum supplement. Standard errors, in parentheses, are adjusted for clustering at the individual level. ***, **, * indicate statistical significance at the 0.01, 0.05, 0.10 levels, respectively.

individuals respond to the program by increasing their labor participation, those with permanent contracts show statistically the most significant effect. It might be that for those with permanent contracts it is easier to resume working with their former employer, while job opportunities are relatively limited for those with temporary or no contracts after a period of unemployment. While all partially disabled workers respond to the program by increasing their daily earnings, those with temporary contracts increase their daily earnings the most. It might be that individuals with temporary contracts are more flexible in adjusting their number of hours worked in jobs with flexible or part-time hours.

Table 7 shows results across three sectors. We find larger or significant effects for individuals who work in the private sector. It appears that job opportunities for disabled individuals are greater in the private than the public sector. Van Sonsbeek and Gradus (2013) show that employers in the private sector are more responsive to financial incentives than those in the public sector. By employing partially disabled workers, firms can reduce their experience-rated disability insurance premium. It is likely that this incentive is felt less by employers in the public sector.

6. Discussion and policy implications

We studied the impact of the financial incentives of the work resumption program of the disability scheme among all individuals who received disability benefits between 2006 and 2013. The financial incentives are due to a change in the disability component of the disability benefit and the expiration of the unemployment component of the disability benefit, which both occur at an individual-specific cut-off date during the period of receipt of benefits in the disability scheme.

We find that the work resumption program has economically large and statistically significant effects on the labor participation of partially disabled individuals. For the average partially disabled individual, the program increases daily earnings by a large amount of 4.83 euros and labor participation by 4.7 percentage points. These findings suggest that the program is effective in stimulating labor participation among partially disabled individuals. Therefore, a first policy implication is that the financial incentives in the work resumption program cannot be relaxed without causing adverse effects in terms of lower labor participation and earnings of those who are partially disabled.

The impact of the program appears to be substantially heterogeneous across pre-sickness wage levels. Individuals with higher pre-sickness earnings respond to the program more than those with lower pre-sickness earnings. The main gains of the disability reforms in the past two decades have been reached by stricter screening and tighter eligibility criteria. Our results suggest that financial incentives within the disability scheme add to this significantly, but only for a comparatively small group of high-income earners. A second policy implication is that it is difficult to create incentives for the large group of partially disabled workers with low pre-sickness earnings. Their incentive to resume working is comparatively low, and, on top of their health impairment, a lack of skills may put additional constraints on their labor participation. Since benefits are already near the social minimum level for a large part of this group, the possibilities for increasing the financial incentives for work are limited.

We find additional evidence that partially disabled individuals with temporary or no contracts are more vulnerable than those with permanent contracts. Financial incentives are less effective in boosting their labor participation, although those working during disability are well capable of increasing their earnings. Therefore, the third policy implication is that additional policy measures to provide job alternatives for the partially disabled in this group who do not work, such as targeted wage subsidies, might be worth considering.

A fourth policy implication concerns the role of employers and employees in the public sector. The financial incentives for employers from experience rating appear to be less effective for employees with a history in the public sector. It might be that these employers are less sensitive to financial incentives to employ workers with disabilities. Additional evidence for this can be found in the poor results in creating jobs for occupationally disabled individuals in the public sector as a consequence of the "Banenafspraak" (*jobs agreement*). That is, in 2013, the Dutch government, employers' organizations, and trade unions agreed to create 100,000 and 25,000 jobs for occupationally disabled individuals in the private and public sectors, respectively, by 2025. By 2019, while the number of jobs created exceeded the target in the private sector, the number of jobs created in the public sector was far short of the target. As the financial incentives in the public sector appear to be less effective, other measures should be tried, such as nudging and increasing the intrinsic motivation to employ the disabled.

We also find that older individuals respond little or not at all to the work resumption program. This age effect can be caused by the circumstance that older individuals find working more onerous, but it can also be caused by employer restrictions that limit access for older individuals to the labor market. Therefore, a fifth policy conclusion is that it might serve no purpose to further increase the incentives for work for older partially disabled individuals.

The higher state pension age may exacerbate the situation of older individuals, since the age effect that we find suggests that, at an older age, partially disabled individuals become steadily less capable of responding to the work resumption program. This means that the work resumption program may become less effective in the future, since a higher state pension age implies a larger number of older individuals in the labor market. However, possible improvements in the health status of older individuals may partially offset the negative age effect that we find. A sixth policy implication is therefore that the impact of the increasing retirement age on the residual work capacity of a growing population of older workers should be carefully monitored.

Moreover, as the state pension age goes up, an important policy question is whether older individuals will tend to rely on their disability insurance to withdraw from the labor market before they reach the state pension age. Compared to the WAO, the WIA has led to a structural decline in disability benefit claims (Van Sonsbeek et al., 2019). However, disability benefit claiming has been on the rise since the introduction of the WIA in 2006 (Berendsen et al., 2019). The annual inflow into the WIA more than doubled between 2006 and 2018. A main factor contributing to the growth

in disability benefit claims is the increasing share of older individuals in the labor market. During the past fifteen years early retirement schemes have been phased out, and since 2003 the state pension age has been going up. As older workers are more likely to be fully than partially disabled, a large part of the increase in disability benefit claims reflects the increase in benefit claims in the IVA scheme, offered to people with full and permanent disability, rather than in the WGA scheme offered to people with partial disability. In 2018, for example, while about two third of the new IVA beneficiaries were 55 years or older, about one third of new WGA beneficiaries were 55 or older. Among the new beneficiaries between 25 and 35 years of age, the probability of being accepted into the IVA scheme has been 7%, while among the new beneficiaries of 65 years or older (still few) the probability of being accepted into the IVA scheme has been 51%. Therefore, it is quite likely that the use of the disability insurance by older workers will increase, but it is unlikely that it will be misused to gradually withdraw from the labor market.

References

Berendsen, E., van Deursen, C., van Sonsbeek, J.-M., 2019. Stijging WIA-instroom nog geen reden tot zorg. Economisch Statistische Berichten 104 (4773), 230–232.

Kantarcı, T., van Sonsbeek, J.-M., Zhang, Y., 2019. The impact of the disability insurance reform on work resumption and benefit substitution in the Netherlands. Netspar Discussion Paper 01/2019-013.

Koning, P., Lindeboom, M., 2015. The rise and fall of disability insurance enrollment in the Netherlands. Journal of Economic Perspectives 29 (2), 151–172.

Koning, P., van Sonsbeek, J.-M., 2017. Making disability work? The effects of financial incentives on partially disabled workers. Labour Economics 47, 202–215.

Van Sonsbeek, J.-M., Gradus, R. H. J. M., 2013. Estimating the effects of recent disability reforms in the Netherlands. Oxford Economic Papers 65 (4), 832–855.

Van Sonsbeek, J.-M., Kantarcı, T., Zhang, Y., 2019. WIA stimuleert arbeidsdeelname en inkomen meer dan WAO. Economische Statistische Berichten 104 (4772), 158–161.

Appendix

We used the difference-in-differences method to investigate the impact of the work resumption program of the disability scheme. In the difference-in-differences analysis, the estimated effects of the work resumption program are interpreted as causal effects if the parallel trends assumption that underlies the difference-in-differences method is satisfied. According to this assumption, individuals with pre-sickness earnings below and above the minimum wage (who constitute the "control" and "treatment" groups, respectively) should share parallel time trends in outcome variables, before and after these groups face the financial incentives of the work resumption program. The assumption is testable during the period before individuals face the work resumption program. Visual evidence in Figure 2, however, suggests that the two pre-sickness wage groups have different time trends in the two outcome variables during the two-year period preceding the work resumption program. Here we use the regression discontinuity method to check if this method provides support for causal inference.

We implement the method using linear regression, where the outcome variable is explained by a treatment variable that takes a value of 1 if the individual receives disability benefits during the second stage of the disability scheme where he or she faces the financial incentives of the work resumption program. The variable takes a value of 0 if the individual receives disability benefits during the first stage of the disability scheme. Other controls include a linear time trend (in months) for the period individuals receive disability benefits during the first and second stages of the disability scheme, marital status, disability degree, whether the individual receives the social minimum supplement, and calendar month indicators for the observation period from January 2006 to December 2013. We also allow for intercepts that vary across individuals to control for individual heterogeneity. The effect of the treatment variable is interpreted as the causal impact of the work resumption program around the date individuals face the financial incentives of the program ("cut-off date"). Using data for the whole observation period of about 13 years individuals receive disability benefits, regression results show that the work resumption program increases average labor participation by 2.1 percentage points and daily earnings by 2.47 euros.[3]

3 During the period from January 2006 to December 2013 the data is observed, the time spent in the first stage of the disability scheme can extend to a maximum of 5 years for some individuals, whereas for others the time spent in the second stage of the disability scheme can extend to almost the full 8 years that are observed. This leads to a maximum duration of 13 years of observed participation in the disability scheme.

The effects are statistically significant at the 1 percent level. Narrower time windows around the cut-off date (as a sensitivity check of bandwidth choice) result in even smaller effects. For example, considering a period of 6 years around the cut-off date leads to an effect size of 1.1 percentage points for labor participation and 1.75 euros for daily earnings. Both effects are significant at the 1 percent level.

When we distinguish between groups of individuals with pre-sickness earnings below and above the minimum wage, as in the difference-in-differences analysis, we find that the work resumption program increases average labor participation by 2.2 percentage points for the high wage group. The effect is 0.3 percentage points for the low wage group. The effects on average daily earnings are 2.62 and 0.31 euros, respectively for the high and low wage groups. The effects are statistically significant at the 1 percent level for the high wage group, while they are insignificant for the low wage group. These results confirm the findings based on the difference-in-differences method and lend support that the effects found using the difference-in-differences method are causal.

The estimated effects based on the regression discontinuity method are smaller than those based on the difference-in-differences method. The reason is that the regression discontinuity method identifies the effect of the work resumption program around the cut-off date (local average treatment effect) where responses to the work resumption program is small, whereas the difference-in-differences method identifies the effect of the work resumption program for the whole observation period individuals receive disability benefits (average treatment effect) where notable responses are observed across the control and treatment groups before and after these groups face the financial incentives of the work resumption program (see Figures 2 and 3).

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